surface **22** for any application period may be less than a maximum dosage (D_{MAX}) (e.g., one non-limiting example of maximum dosage (D_{MAX}) may be 1,000,000 μJ/cm^2 or 1 J/cm^2), and this maximum dosage may be associated with minimizing interior component deterioration.

[0078] In block **440**, computer **14** also may actuate a timer (e.g., via processor **40**) to track the exposure time. This timer may be executed in software via processor **40** (or via an electrical timing circuit coupled to processor **40**). Regardless, as discussed above, this UV light may be directed at the targeted interior surface **22** of cabin **20**—which also may include a corresponding light detector **52**. As the computer **14** may attempt to deliver UV light to the surface **22** according to the dosage, block **440** may include adjusting a magnitude of the emission intensity (Φ) based on the feedback data provided by detector **52** (as discussed above).

[0079] Following block **440**, computer **14** may re-determine whether a user is in the vehicle **12** (block **450**). This instruction may be similar or identical to block **420**; therefore, it will not be re-described herein. Using this block, computer **14** may repeatedly check the cabin **20** for a user ingressing vehicle **12** (e.g., during the transmission of UV light). In at least some examples, block **450** may include determining that a user is approaching vehicle **12**, a user is opening a vehicle door, or the like. When computer **14** determines in block **450** that vehicle **12** remains in the unoccupied state, then process **400** may proceed to block **460**. And when computer **14** determines that the vehicle is in an occupied state or about to be occupied, then process **400** proceeds to block **470** (discussed below).

[0080] In block **460**, computer **14** determines whether the exposure duration (t_{EXPOS}) has expired by comparing the current run time of the timer (previously initiated) with the exposure duration (t_{EXPOS}). When computer **14** determines that vehicle **12** the exposure duration (t_{EXPOS}) has not expired, then process **400** may loop back to block **440**. And when computer **14** determines that the exposure duration (t_{EXPOS}) has expired, then process **400** proceeds to block **470**. Thus, computer **14** may execute blocks **440**, **450**, and **460** repeatedly—e.g., checking the occupancy state of the vehicle **12** and whether the exposure duration (t_{EXPOS}) has expired. In the latter case (as discussed above), de-actuating the light source **50** at the expiration of the exposure duration (t_{EXPOS}) inhibits overdosing of targeted surface **22**—e.g., and mitigating premature deterioration of the vehicle interior components.

[0081] In block **470**, computer **14** actuates the light source **50** to an OFF state. As discussed above, this may occur following a user ingress attempt or a user ingressing the vehicle **12** (e.g., block **450**) or following the expiration of an exposure duration (e.g., block **460**). During instances when multiple light sources **50** are dosing one or more interior surfaces **22**, and when a user ingress is detected (block **450**), computer **14** may de-actuate all light sources **50** via instructional block **470**.

[0082] Following block **470**, process **400** may proceed to block **480**, to block **410**, or end. For example, optional instructional block **480** may comprise computer **14** actuating at least one climate control parameter based on the sensor data collected in block **410** and/or based on the calculated UV dosage of block **430**. As used herein, actuating a climate control parameter is a computer-actuated operation of the climate control system **30**: that, when the parameter is adjusted, changes a temperature of the vehicle cabin **20**; that, when the parameter is adjusted, changes a humidity within the cabin **20**; and/or that, when the parameter is adjusted, changes a volume of forced air into the cabin **20**. Non-limiting examples include increasing the temperature of the cabin **20**, decreasing the humidity within the cabin **20**, and increasing the amount of forced air (e.g., through HVAC vents into the cabin **20**).

[0083] According to at least one example, one or more climate control parameters are actuated by computer **14** in response to a determined contamination type. In this manner, when the light source(s) **50** are in the OFF state, additional contaminant growth is minimized.

[0084] Following block **480**, the process **400** either ends or loops back and repeats (at least a portion thereof) beginning with block **410**. Similarly, when optional block **480** is omitted, the process proceeds from block **470** to either block **410** or simply ends.

[0085] Other examples exist. For example, block **470** may be executed when computer **14** determines that light source **50** is actuated but light detector **52** is receiving less than a threshold (e.g., less than **100** μJ/cm^2) amount of UV light—e.g., indicating a misalignment of source **50** and detector **52**. As a result, computer **14** may execute a shut-off instruction and may generate a diagnostic trouble code and not actuate the light source **50** until the vehicle **12** has been serviced by an authorized service technician.

[0086] Similarly, according to at least one example, block **470** may be executed when computer **14** determines that light source **50** is actuated but light detector **52** is receiving UV light within a threshold range (e.g., 100-500 μJ/cm^2)—e.g., indicating a potential fault at source **50** and/or detector **52**. Similarly, computer **14** may execute a shut-off instruction and may generate a diagnostic trouble code and not actuate the light source **50** until the vehicle **12** has been serviced by an authorized service technician.

[0087] Similarly, according to at least one example, block **470** may be executed when computer **14** determines that light source **50** is actuated but light detector **52** is receiving UV light greater than a threshold (e.g., 2000 μJ/cm^2)—e.g., indicating a potential fault at source **50**. Similarly, computer **14** may execute a shut-off instruction and may generate a diagnostic trouble code and not actuate the light source **50** until the vehicle **12** has been serviced by an authorized service technician.

[0088] According to at least one example, in block **420**, computer **14** also may determine window state data and/or controls the state of the vehicle windows (e.g., from an open state to a closed state)—e.g., prior to actuating the light source **50**. In this manner, UV light from the source **50** may be contained within the vehicle **12**—e.g., particularly if the windows are manufactured with a protective UV-blocking film, polarizing glazing, or the like.

[0089] Tables I, II, and III illustrated a constant intensity value (e.g., 1000 μW/cm^2) of UV light received at the surface **22**, and the exposure duration (t_{EXPOS}) was increased in some instances (e.g., by a multiplier) to vary UV dosage. According to another example, UV dosage may be varied by changing the UV intensity (Φ), changing the exposure duration (t_{EXPOS}), or a combination thereof. Of course, when computer **14** increases the UV intensity, the intensity still may be bounded by a threshold range or maximum (e.g., between 500-2000 μW/cm^2).

[0090] Thus, there has been described a cleaning system for a vehicle. The system includes a computer and a lighting